TACSM Abstract

A Comparison of Heart Rate Slope Between High Fit and Recreational Fit Cyclists

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ABSTRACT

During an incremental exercise test of increasing intensity, neural influences guide a coordinated response by the cardiovascular system altering heart rate during work. The shape of the heart's response to incremental exercise can be explained by general assessments of two neural responses referred to as parasympathetic and sympathetic activity. This shape of the heart rate response changes based on fitness status of the individual. The purpose of this study is to assess slope of heart rate response between groups of differing fitness status. Heart rate data was archived from previous tests done in the Cycling Performance Laboratory on the campus of Midwestern State University. Male and female cyclists acted as subjects within the retrieved data. The following information was assessed: age (years), height (cm), weight (kg), body fat (%) and heart rate (bpm) at every workload . Within the fit demographic, quartiles were established based on their maximal oxygen consumption (Max VO_2) values with quartile 1 being the least fit and quartile 4 being the most fit. Heart rate data from the quartiles and from recreational subjects were compared. A trend line of best fit was assigned to each quartile of heart rate response. Trend line equations were used to identify rates of change (i.e., slope) for comparisons. Group mean slopes were determined for association or differences. Variations were compared between groups. A Pearson Product R Correlation analysis was used to establish correlations. An independent samples t-Test with Tukey post hoc comparisons was used to determine differences between groups. Statistical significance was determined *a priori* at $p \leq 0.05$. Mean (SD) descriptive values were the following: age, 19.5 (1.9) y; height, 177.5 (4.1) cm; weight, 80.6 (5.6) kg; body fat 8.3 (1.1) %. Heart rate slope between groups was the following: quartile 1, 1.38; quartile 2, 1.56; quartile 3, 1.41; quartile 4, 1.39; recreational, 3.09. Significant ($p<0.05$) associations were established between slopes for the fit quartiles (1-4). Significant differences ($p<0.01$) were found between the quartile slopes and the recreational group slope. From the assessment of heart rate slope, differences were seen primarily between the fit quartiles and the recreational group. Heart rate slope was not different between quartiles but was steeper and statistically different in the recreational group. In summary, heart rate slope was altered with fitness status. This alteration indicates a favorable differences as fitness status is increased.

TEXAS CHAPTER
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